

Conference Abstract

Using Specify 6, 7 and Web Portal Instruments for the North Siberian Biodiversity Data Platform

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Abstract

The digitization and mobilization of biodiversity data are actively ongoing in the northern part of Western Siberia (Tyumen Oblast, Russia), where the history of biodiversity research is relatively short. For small collections and young universities, it is essential to have a ready-made software product, like Specify*¹, for managing the collection and publishing data openly. Our use of Specify tools began with a local installation on a single computer in 2015. Now we have a deployed system consisting of two disciplines and ten collections used by five organizations (Table 1), and we utilize Specify 6, Specify 7, the [Attachment Server](#), and Web Portal tools.

Table 1.

The collection structure of the Northwest Siberia Specify installation.

Collection title and GBIF dataset URL	Organization	Number of specimens	Discipline
Fungarium of Yugra State University	YSU	10892	Mycology
Bryological collection of Yugra State University	YSU	6241	Botany
Fungarium of Elena Zvyagina	YSU	1645	Mycology

Collection title and GBIF dataset URL	Organization	Number of specimens	Discipline
Herbarium of Nature Park "Kondinskie Lakes"	Nature Park "Kondinskie Lakes"	1221	Botany
Herbarium of Yuganskiy State Nature Reserve	State Nature Reserve "Yuganskiy"	862	Botany
Fungarium of Central Siberian Botanical Garden (NSK)	Central Siberian Botanical Garden	812	Mycology
Herbarium of Yugra State University	YSU	523	Botany
Fungarium of Nature Park "Kondinskie Lakes"	Nature Park "Kondinskie Lakes"	338	Mycology
Lichen collection of Yugra State University	YSU	157	Mycology
Herbarium of Nature Park "Numto"	Nature Park "Numto"	145	Botany

The checklist of the Western Siberian Specify installation activities includes:

- Personal collection of fungi since 2015
- Using Specify 6 + Specify 7 + Web Portal since 2017 for university collections management
- Development of a Northwest Siberia bioportal*² since 2018
- Development of a Mycological Portal of West Siberia*³ since 2024
- Organization of educational events
- Helping with localization in Russian language
- Developing instructions and help videos in Russian language*⁴
- Developing DNA-derived data schema in Specify 6 since 2023

The main uses of the installation include storing specimen label information, the physical storage location of specimens, and associated digital information (e.g., scans, live images of objects, or microphotographs). We also utilize Specify's reports for generating customized labels and reports on loans or gifts. Taxonomical, geographical, and storage hierarchical trees are used to organize data. Recently, tables associated with molecular data have been more actively utilized to store DNA sequences, their metadata, and trace files.

The Specify database is linked via Structured Query Language (SQL) to the Global Biodiversity Information Facility's ([GBIF](#)) Integrated Publishing Toolkit ([IPT](#)) for publishing collections data through GBIF. The automatic updates are regularly done once a week. Using separate queries, our collection data is regularly exported and published on the local portals, where data on labels, molecular data, distribution maps (Fig. 1) and photographs are presented (Fig. 2).

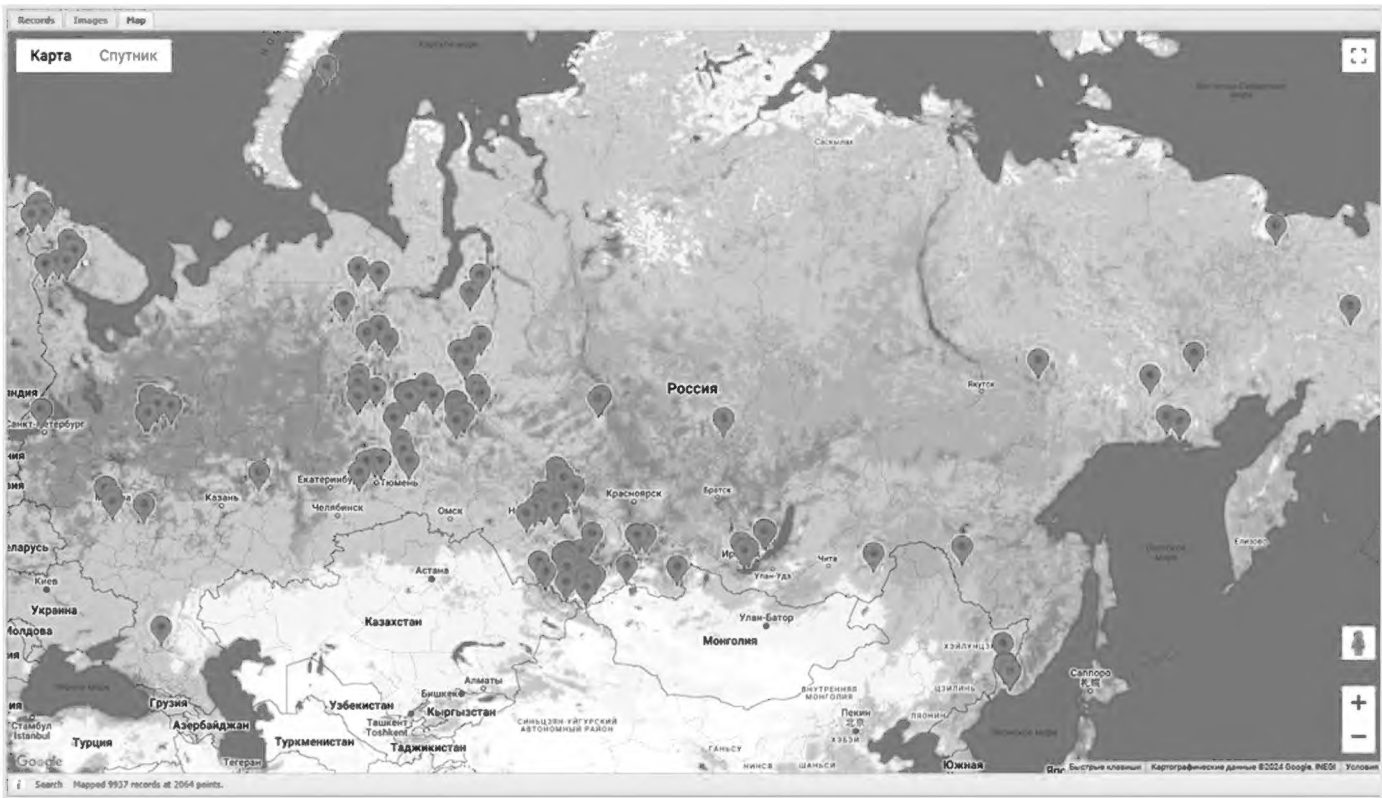


Figure 1.
A distribution map displaying occurrences of specimens from the Fungarium YSU collection on the Mycological Portal of West Siberia

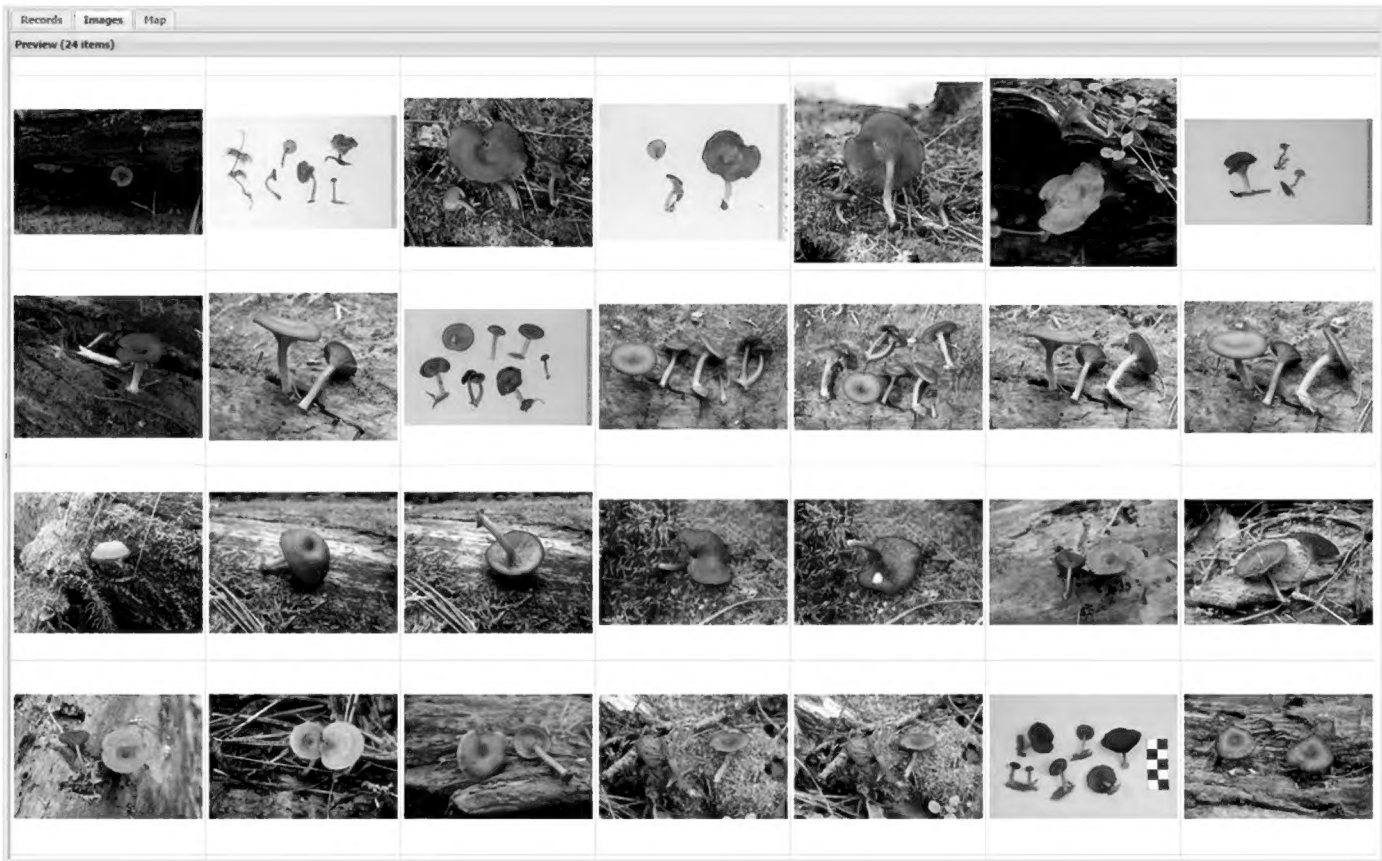


Figure 2.
An example of a tab displaying images of *Arrhenia discorosea* from the Fungarium YSU collection on the Mycological Portal of West Siberia (the displayed images taken by T. Bulyonkova, N. Filippova).

Currently the Specify installation hosts 10 collections from two disciplines and has about 20 users. It contains about 22,000 specimens with 33,000 images attached, and about 1,500 DNA sequences (Table 1).

Two platforms for external access to collections were created using the Specify Web Portal tool, and serve as a hub for region- and discipline-oriented collections:

- Northwestern Siberia Bioportal*² for all regional collections (currently hosts 10 collections from 5 organizations);
- Siberian Mycological Portal*³ specifically for mycology collections in Siberia (5 collections from 3 organizations).

In recent years, we have been actively barcoding the specimens of the Fungarium of Yugra State University (YSU) collection. As a result, two related tables are exported to IPT: one for the collection specimens and another for DNA-derived data (the resulting dataset Filippova et al. 2024). Several ready-made queries were built to export DNA-derived data to other molecular data portals ([GenBank](#), International Barcode of Life ([iBOL](#)), and [PlutoF](#)). A special protocol on DNA-derived data storage and export using Specify was published on [Protocols.io](#) to standardize the procedures and pass on the skills (Filippova and Zvyagina 2024).

Keywords

collection management software, collection database, GBIF, IPT, fungarium

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Conflicts of interest

The authors have declared that no competing interests exist.

References

- Filippova N, Zvyagina E (2024) Загрузка сиквенсов в базу данных коллекции (Specify 7) и экспорт данных в GenBank и GBIF. protocols.io. <https://doi.org/10.17504/protocols.io.3byl4975jgo5/v1>
- Filippova N, Zvyagina E, Bulyonkova T, Rudykina E (2024) The Fungarium of Yugra State University. Version 1.163. Yugra State University Biological Collection (YSU BC). Occurrence dataset accessed via GBIF.org on 2024-10-14. <https://doi.org/10.15468/g4bk6h>

Endnotes

- *1 <https://www.specifysoftware.org/>
- *2 <http://biportal.ugrasu.ru/>
- *3 <http://mycoportal.ugrasu.ru/>
- *4 <https://nwsbios.org/specify-in-russia/>